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ABSTRACT

This paper examines the administrative uses of the microcomputer, stating that high performance educational managers are likely to have microcomputers in their organizations. Four situations that would justify the use of a computer are: (1) when massive amounts of data are processed through well-defined operations; (2) when data processing is highly repetitive; (3) when processing speed is important; and (4) when the task can be performed by a computer, and manual performance is not practical. Tasks that can be automated by microcomputers are discussed for 16 administrative functions. Descriptions of the tasks are based on the capabilities of software recommended by at least two principals in two National Association of Secondary School Principals (NASSP) surveys and two surveys of Florida principals. Four functions--student records, scheduling, attendance accounting, and grade analysis and reporting--are identified as constituting over 50 percent of the NASSP survey recommendations. The remaining functions are listed as athletics, budgeting, financial accounting, food service, guidance, information from data banks, instructional management, inventory and property records, media center, planning, staff/personnel records, and student transportation. Each function is examined in depth and capabilities of the software for each function are highlighted. (WTH)

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THE PRACTITIONER

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A Newsletter for the On-Line Administrator

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Administrative Uses of Microcomputers

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Administrative Uses of Microcomputers

Educational administrators are learning how to thrive and survive with microcomputers. The earlier generations of these electronic marvels were appropriate only for instructional use, primarily because of their small data storage capacity. But some microcomputers now available equal the storage capacity of older, full-size computers found in school district data processing departments.

Microcomputers are not yet ready to replace "mainframe" computers, but they can certainly supplement them and automate some tasks never before thought feasible. Computers have become smaller, smarter, faster, less expensive, and easier to use than any product of the industrial revolution. And the programs (software) that perform administrative tasks are increasing in capability and quality.

High performance educational managers are more likely to have microcomputers in their organizations, according to a Florida State University College of Business study. This Practitioner will alert you to the many potential administrative uses of these newest "principal's helpers."

When Do You Use a Computer?

Four situations would generally justify the use of any computer:

- When massive amounts of data are processed through well-defined operations
- When data processing is highly repetitive
- When processing speed is important
- When the task can be performed by a computer, and manual performance is not practical.

The following 16 administrative functions in education have one or more data processing tasks a microcomputer can perform:

- | | |
|---------------------------------|------------------------------------|
| 1. Athletics | 9. Instructional management |
| 2. Attendance accounting | 10. Inventory and property records |
| 3. Budgeting | 11. Media center |
| 4. Financial accounting | 12. Planning |
| 5. Food service | 13. Scheduling |
| 6. Grade analysis and reporting | 14. Staff/Personnel records |
| 7. Guidance | 15. Student records |
| 8. Information from databanks | 16. Student transportation. |

(Word processing is another major capability of microcomputers, but because of space limitations, word processing is not covered in this Practitioner).

We will discuss the tasks that can be automated by microcomputers for each of these 16 functions. The descriptions of these tasks are based on the capabilities of software recommended by at least two principals. The recommendations come from two NASSP surveys (September 1984 and May 1985 issues of the Newsleader) and two surveys of Florida principals (June 1984 and June 1985).

Software titles and producers' names recommended by principals are not identified in this Practitioner. For a copy of the list of specific software, including those recommended for word processing, please write to the Research Department, National Association of Secondary School Principals, 1904 Association Drive, Reston, Va. 22091.

Student records, scheduling, attendance accounting, and grade analysis and reporting represent only 25 percent of the 16 functions into which all recommended software has been grouped, but they constitute 53 percent of all NASSP survey recommendations. Principals satisfied enough to make recommendations are using microcomputers more for these four functions than for the other dozen combined.

These functions can share much data among them. Software producers, therefore, have developed comprehensive packages that address all four functions. Once student records are stored in a computer, a little more data will produce class schedules. With scheduling data stored in the computer, the framework exists for processing period-by-period attendance and grade reports.



A number of Florida school districts are performing these four administrative functions on microcomputers. The largest is the Polk County School District (1915 South Floral Ave., Barton, 33830, (813) 534-1511) with about 90 schools. Except for high volume printing tasks such as generating grade reports, microcomputers perform all four functions while the district's mainframe computer stores a backup copy of each school's data.

Student Records

A student records system will store and retrieve basic information about each student. Items of data, usually called "fields," may include

first, middle, and last name; sex; ethnic group; age and birthdate; student identification number; parents' or guardians' names, address(es), and phone number(s); homeroom; locker number; and more. A well-designed system permits the user to define additional items of data (fields) unique to each school's setting.

A student records system allows access to data by name, identification number, or another criterion such as bus number or immunization status. As the volume of data items increases, better software makes it possible to group similar items together for display on separate screens of the microcomputer. Examples are academic history, discipline, federal programs, food service, medical records, test scores, transportation, etc.

Tabular reports can be produced from a selection of data items. Labels can also be produced for mailing by zip code order, for file folders in alphabetical order by grade, and for card files in alphabetical order for the entire school.

Filing, sorting, searching for, and reporting student information are tasks that data management systems perform well. Good reasons exist for choosing software specifically for student records rather than a data management or integrated system. If you plan to use student records data for other computer tasks such as scheduling, attendance accounting, or grade analysis and reporting, the software for these functions can use data already stored by the student records software. If student records data are processed by a data management or integrated system, you may have to enter much of the same data again to perform these other functions.

► Coming in the future for microcomputer student records systems: electronic data transfer. The data previously collected in Florida schools on 32 different forms will be electronically transferred to the state department of education. Student transcripts and associated data will subsequently be transferred electronically to public schools as well as to colleges and universities. As students transfer from one school or district to another, their records will be transferred electronically.

Scheduling

Scheduling software performs tasks ranging from student locator to master schedule generator. A big advantage offered by microcomputer scheduling is the number of attempts a school can make to develop a final schedule. As long as time permits, administrators can rework a master schedule on-site to reduce the number of conflicts and to improve the quality of the schedule.

Scheduling software for microcomputers can:

1. Generate a master schedule from student requests and produce a conflict matrix
2. Test student requests against various combinations of course offerings while producing conflict matrices
3. Balance section assignments for number, sex, and ethnic group

4. Provide for prerequisites, corequisites, and priority assignments for required courses
5. Block schedule courses for specified groups of students
6. Schedule four quarters of up to 32 course selections for 10-day periods with continuity for semester and year courses
7. Show alternate sections and permit reassignment for any period
8. Print individual student schedules, alphabetized class rosters, and staff assignments
9. Determine room utilization for all periods
10. Report unassigned periods for students, staff, and rooms.

Scheduling software has the potential to push a microcomputer closer to its capacity than any other administrative use. Not all software marketed for scheduling can actually generate a schedule based on student requests or produce a conflict matrix. If you discuss scheduling software with a marketing representative, be sure to ask questions about your needs. Let the buyer beware!

► Coming in the future for microcomputer student scheduling: the capability to handle variable length periods, to test for almost any relationship involving scheduling data, and to produce an individual educational plan (IEP) for every student.

Attendance Accounting

Attendance accounting software collects and organizes absence and tardy information as well as 20-day or monthly, six-weeks or nine-weeks, semester, and yearly records. Most attendance software is comprehensive, recording period-by-period or course-by-course attendance. Software recording only daily attendance may not be cost effective for many schools unless communication with parents by letters and recorded messages is substantial enough to keep absences to a manageable level.

Attributes of attendance accounting software include:

1. Capability of using optical mark scanners or card readers for speed and accuracy of data entry
2. Capacity to record up to 16 categories of absences
3. Weekly, daily, and periodic reports of absentees, attendance exceptions, and attendance profiles
4. Lists of absentee parents' names with phone numbers in school-specified categories
5. Form letters addressed to parents after a specified number of absences of certain types
6. Automatic dialing of home phone numbers during school as well as evening hours with a recorded message to parents and with a provision for parental responses
7. Transfer of attendance data to grade reports.

To record period-by-period attendance through an entire school year, software that performs that specific task is a necessity. More than two-thirds of the software recommended by principals for attendance accounting is designed only for that purpose.



An interesting attendance package is used in many secondary schools of Broward County, Florida (Ft. Lauderdale). "Big Mouth," as the students at McArthur High School (6501 Hollywood Blvd., Hollywood 33024, (305) 963-8000) call it, is a software/hardware package that uses a microcomputer to call students' homes. It can dial as many as 32,000 numbers with up to 99 messages. Parent responses can be recorded for staff action the next day. Calls can be made during the school day within an hour of a student's absence from a class, and during specified evening and weekend hours when school staff are not on duty. Attendance has increased 5 to 7 percent over a three year period. In addition to calling about absences and recording responses, the program can communicate messages about awards, honors, health needs, library fines, PTA/PTO meetings, report cards, school closings, school events, and more.

McArthur High School, the first school in the district to use Big Mouth, now uses it as a "voice bulletin board." Parents with touchtone telephones can call for any of 10 different messages. The school can also conduct surveys with "Big Mouth" recording the touchtone responses.



In 10 New York City high schools, students are issued plastic identification cards. Punched holes in each card permit a reading device at school entrances to acknowledge the arrival of each student and flash messages about reporting to a specific office if need exists. If a serious problem is detected, the student card is seized by the reading devices, an alarm sounds, and a nearby security guard is notified of the specific problem. The 10 participating schools have averaged a 2 percent increase in attendance and a significant decrease in wall graffiti (apparently done by non-students). Park West High School (525 West 50th St., New York 10019, (212) 247-2650) where the system was first installed three years ago, is now using it to restrict access to certain areas of the school such as the library, lunchroom, and gymnasium in accordance with each student's schedule.

An attendance accounting clerk can take a laptop portable microcomputer through the halls each period to collect the names of students absent from each class. Teachers can indicate absentees on a list printed with bar codes outside each classroom door. A light pen attached to the laptop portable reads and stores these names. After all absences are recorded, the data can be transferred to the office microcomputer that processes attendance data.

► Coming in the near future: A record-keeping alternative for schools with a microcomputer or scanner in each classroom. The device would be connected to an office microcomputer and attendance data transferred as it becomes available. Some systems can use the existing wiring.

Grade Analysis and Reporting

Grade analysis and reporting software produces student grade reports as well as final transcripts, grade point averages, and class rankings.

Specialized functions may include selection of honor roll students, printing of failure and incomplete lists, determination of athletic eligibility, and analysis of grade distributions for individual teachers, subjects, departments, grade levels, or any other variable selected.

Specialized software is the choice for production of student grade reports, grade point averages, class ranks, transcripts, and analyses of grades. More than 70 percent of the software recommended by principals for grade analysis and reporting is specific to this function. Data management, spreadsheet, and integrated systems combined received less than 30 percent of the recommendations for these functions.

► Developing software to meet the many school variations in reporting grades has stymied some software producers. In the future, we will probably see an extension of grade analysis and reporting software for classroom level assessment and then for instructional management tasks.

Athletics

Athletics software is used primarily to analyze football and basketball statistics for home teams and opponents. Football software charts offensive and defensive tendencies for up to 100 play situations per game. Basketball software permits trend analyses of 16 players in 48 games for 10 standard statistical categories plus 6 more locally defined. Athletic eligibility software is available, but it may not meet your state's requirements and may be redundant with existing reports from grade analysis and reporting software. To keep track of miscellaneous information on individual athletes, a data management system is more appropriate.

Budgeting and Financial Accounting

Budgeting and financial accounting may be performed on a microcomputer with an electronic spreadsheet. Budgeting usually covers fund, function, object, and program budgeting as well as cost center control. Financial accounting at the school level encompasses activity or club funds and student billing or accounts receivable.

Budgeting and other financial tasks involve a rows-by-columns table of numbers. These tasks can be performed efficiently with an electronic spreadsheet or the spreadsheet part of an integrated system. Spreadsheets received 61 percent of the survey recommendations for budgeting and 51 percent for financial accounting. Most problems that can be analyzed with a calculator, a pencil, and a sheet of paper can be solved more efficiently with electronic spreadsheet software. "What if" questions can be easily answered. Working out the design of a task on a spreadsheet may require a little time, but the ultimate time savings and improved efficiency are usually well worth it.



Bob Schramke, principal of Redford Union High School (17711 Kinloch, Redford, MI 48240, (313)592-3395), one of the pioneer principals using

microcomputers, reports that an electronic spreadsheet has saved his bookkeeper several days of work each month, reducing the tasks to a few hours.

Software designed specifically for budgeting garnered only about 17 percent of the recommendations, and that for financial accounting just 28 percent. Activity accounting software dominates the latter group. This software will process 250 transactions per month for up to 100 accounts and produce a variety of reports.

Food Service

Food service software deals with cost analyses, food sales revenue accounting, nutrition analyses, and participation data. Food service is a centralized operation in most school districts so principals made very few recommendations for this function.

Guidance

Guidance software offers career decision-making information to students and counselors that was previously available only on mainframe computers. Possibilities include apprenticeships, occupations (both civilian and military), vocational and technical schools, business and industry data, two- and four-year colleges, graduate and professional schools, and sources of financial aid. Students are queried about such areas such as work activities, interests, abilities, values, perceptions, preferences, and plans.



The Career Information of Iowa Program (Iowa State Department of Education, Grimes State Office Bldg., Des Moines, 50319, (515) 281-3799) provides schools with microcomputer software and data allowing students to access occupational information, programs of study, and identified institutions based on occupational training. This and similar systems permit repetitive use by students, considerable confidentiality, opportunity for counselors to spend more time counseling instead of searching for information, multiple access points in a school, and use at home (with hardware borrowed from the school).

Information From Databanks

Software that accesses information from databanks connects your microcomputer via telephone to a large computer containing a variety of sources of information. Two such services provide information of specific interest to educational administrators: the American Association of School Administrators' ACTIONLINE (formerly call ONLINE) and the National School Public Relations Association's ED-LINE. Other software packages provide general information from dozens of national information banks such as United Press International, news bulletins, stock market reports, airline schedules, weather reports, travel facts, and major newspapers.



ACTIONLINE features:

Governmental Relations updates on legislative, judicial, and regulatory items
 Morning Alert on key Congressional and executive agency meetings
 Legislative Issues Update on key issues reaching into the upper echelons of government
 Developments at the U.S. Department of Education
 Management Tips of the week
 USA Today's news wire service
 Access to GTE's electronic mail service.



ED-LINE offers the following databases:

Education USA Newslite	Network Directory of Subscribers
School PR Line -- The NSPRA Network	State Networks
Federal Alert	Ed Exchange
EDTECH Update	Useful Facts and Figures from NIE
Legal Briefs	What's New in Research
RURALINE	Classroom Ideas
National Networks -- The Source	Bonus Items.
Excellence in Education	

Instructional Management

Instructional management software covers a range of tasks from monitoring student progress in a classroom using computer-assisted instruction (CAI) to tracking student progress for a whole school district on specified curriculum goals, objectives, and skills. The more comprehensive instructional management software can share data with software for attendance accounting, grade analysis and reporting, scheduling, and/or student records.

Slightly more than half of the software recommended in the survey for instructional management is specific to that task. Much of instructional management software is developed by publishers for specific curricula of an instructional series. Some instructional management software is designed for exceptional student programs (IEPs).

Data management, spreadsheet, and integrated systems received less than half of the principals' recommendations, but any instructional management task that involves the tracking of students' progress through specified curriculum skills can probably be performed satisfactorily by a data management system.



In 1981, the elementary schools of Palm Beach, Florida County (3323 Belvedere Road, W. Palm Beach 33402, (305) 847-3147) began an instructional management program using microcomputers. The program is now expanding into middle schools. Students can be assessed on more than 2,600 objectives keyed to the school board's goals and objectives. Data must now be entered with scanners, but interactive assessment is being planned.

► In the future we may see manageable individual education plans (IEPs) for each student. Microcomputers will be able to record student achievements, performance on criterion-referenced tests, demonstrated competencies, learning styles, honors, awards, interests, and other pertinent information. Computer-managed instruction (CMI) will use technology to track students' progress.

Inventory and Property Records

Inventory and property records software acts as an electronic filing system for cataloging equipment and other fixed assets, inventory, textbooks, and other items. Each software package contains pre-defined fields to be kept on each item in the electronic file. Some principals are using software designed for the school's media center to keep track of all school property.

The reports needed for most inventory and property records can be generated by data management systems. The filing, sorting, searching for, and reporting of inventory and property records are tasks that data management systems perform well. Data management systems and integrated systems (probably the data management component) garnered more than 80 percent of the software recommendations for inventory and property records.

Media Center

Media center software performs many tasks, including:

- Circulation (overdue notices, student lists by homeroom, etc.)
- Bibliographic lists (by author, title, or call number order)
- Production of in-house catalogs of special holdings (magazines, audiovisual titles, vertical files, microfiche)
- Printing of catalog cards (both spine and pocket labels)
- Inventory (book collections, audiovisual equipment, non-print materials)
- Acquisitions (consideration files and purchase orders)
- Budget (expenditures by fund categories).

More than 300 specialized commercial software packages perform media center tasks. Most perform a single task and require only floppy disks. About 15 companies produce software for disk drive that integrates two or more tasks.

The filing, sorting, and searching for various kinds of data in a media center are tasks well-suited to data management systems. Data management systems and integrated systems garnered almost two-thirds of the survey recommendations for media center operations.



Clayton Valley High School (1101 Alberta Way, Concord, Calif., 94521 (415) 682-7474) performs all of the tasks listed above with microcomputers. Last year the school received the American Library Association microcomputer award for library management.

► In the future, not only will the "card catalog" be replaced by computerized files, but your librarian will be able to access the bibliographic and circulation files of most of the school and public libraries in your area. Students will find it easier to obtain the materials they need, and costs for each library will be reduced by avoiding duplicate acquisitions. Information banks from around the world will become accessible and affordable. Computer databanks may eventually replace many of today's printed sources.

Planning

Software for educational planning is still scarce, although a considerable selection exists in the business field. Project management software using the Critical Path Method (CPM) or Program Evaluation Review Technique (PERT) is finding favor in some business environments. One software package currently available assists principals in planning to implement microcomputers. Software for population forecasting, attendance boundary, and site location is now available. Electronic spreadsheets, described earlier under "budgeting and financial accounting," can provide a framework for financial, student, and staff projections.

Data management, spreadsheet, and integrated systems garnered four out of five survey recommendations for planning software. Data management systems received 45 percent, integrated systems 25 percent, and spreadsheet systems 10 percent. Software specific to planning received only 20 percent of the recommendations.

Staff Records

Staff records software is used for filing, sorting, searching out, and reporting such personnel data as name, address, telephone, demographics, class schedule, educational training, and certification. Data management and integrated systems garnered two-thirds of the survey recommendations in this area.

About one-third of the software recommended for staff records is specific to that task. A good reason for choosing this dedicated software instead of a data management or integrated system is to have data available for other computer tasks such as scheduling, attendance accounting, grade analysis and reporting, or instructional management.

Student Transportation

Student transportation scheduling and maintenance is a centralized operation in most school districts so principals have little need for this software. Good student records software keeps track of bus numbers, routes, and times. A data management system can be used to establish a system to your own specifications.



At Larose-Cutoff in Larose, Louisiana (P.O. Box 186, Larose 70373, (504) 693-3273), Chris Bowman uses integrated software (data management and spreadsheet components) to schedule buses. The data management component analyzes geographic codes, determines when the capacity of a bus is reached, assigns a bus number for each student, and sorts the results by teacher and by student. The spreadsheet component produces frequency distributions and bus number assignments.

Data Management

Data management systems are recommended more frequently by principals than any other kind of software. In the NASSP and Florida surveys, 43 percent of all microcomputer data processing recommendations were for data management systems.

The administrative functions most frequently performed by data management systems are:

- Inventory and Property Records (62+%)
- Media Center (62%)
- Food Service (55%)
- Staff Records (53%).

A data management system is more cost effective than software designed for just one administrative function because of the multiplicity of its uses.

A data base is the computer equivalent of several filing cabinets full of information. You create your own data base and store within it any kind of information you may want to retrieve. The information can be retrieved to refresh your memory or to generate reports. A good data management system offers significant capability to generate reports, without programming, in the format most useful to you. Expect any good data management system to make sense even when you know little or nothing about computers, programming, or data base uses.



Tom Kartsotis, principal of Nitschmann Junior High School in Bethlehem, Pa. (909 West Union Blvd., Bethlehem 18018 (215) 866-5781) expresses great satisfaction in using the most recommended data system. Even with no previous computer experience, he says that his data management system "has probably had the most revolutionary effect in the administration of a school in my 25 years of experience." He uses it for studies, data analysis, surveys, student information files, and inventories. "It has made our total operation more effective and has assisted us in reducing our costs."



Fermin Burgos, principal of Kosciuszko Middle School (971 West Windlake Avenue, Milwaukee, Wisc. 53204 (414) 383-3750), is using a data management system to develop student disciplinary profiles and to chart referrals by category and frequency of offense. Used this way, the system is a decision-making tool for improving school discipline.

This Practitioner was prepared by Chase Crawford, program specialist in administrative uses of micro-computers, department of education, State of Florida, Tallahassee.

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